CLAIMS

We claim:

1. A targeting construct comprising:

   (a) a first polynucleotide sequence homologous to a CX2 gene;

   (b) a second polynucleotide sequence homologous to the CX2 gene; and

   (c) a selectable marker.

2. The targeting construct of claim 1, wherein the targeting construct further comprises a screening marker.

3. A method of producing a targeting construct, the method comprising:

   (a) providing a first polynucleotide sequence homologous to a CX2 gene;

   (b) providing a second polynucleotide sequence homologous to the CX2;

   (c) providing a selectable marker; and

   (d) inserting the first sequence, second sequence, and selectable marker into a vector, to produce the targeting construct.

4. A method of producing a targeting construct, the method comprising:

   (a) providing a polynucleotide comprising a first sequence homologous to a first region of a CX2 gene and a second sequence homologous to a second region of a CX2 gene;

   (b) inserting a positive selection marker in between the first and second sequences to form the targeting construct.

5. A cell comprising a disruption in a CX2 gene.

6. The cell of claim 5, wherein the cell is a murine cell.

7. The cell of claim 6, wherein the murine cell is an embryonic stem cell.

8. A non-human transgenic animal comprising a disruption in a CX2 gene.

9. A cell derived from the non-human transgenic animal of claim 8.

10. A method of producing a transgenic mouse comprising a disruption in a CX2 gene, the method comprising:

   (a) introducing the targeting construct of claim 1 into a cell;

   (b) introducing the cell into a blastocyst;

   (c) implanting the resulting blastocyst into a pseudopregnant mouse, wherein said pseudopregnant mouse gives birth to a chimeric mouse; and

   (d) breeding the chimeric mouse to produce the transgenic mouse.

11. A method of identifying an agent that modulates the expression of a CX2, the method comprising:

(a) providing a non-human transgenic animal comprising a disruption in a CX2 gene;

(b) administering an agent to the non-human transgenic animal; and

(c) determining whether the expression of CX2 in the non-human transgenic animal is modulated.

12. A method of identifying an agent that modulates the function of a CX2, the method comprising:

(a) providing a non-human transgenic animal comprising a disruption in a CX2 gene;

(b) administering an agent to the non-human transgenic animal; and

(c) determining whether the function of the disrupted CX2 gene in the non-human transgenic animal is modulated.

13. A method of identifying an agent that modulates the expression of CX2, the method comprising:

(a) providing a cell comprising a disruption in a CX2 gene;

(b) contacting the cell with an agent; and

(c) determining whether expression of the CX2 is modulated.

14. A method of identifying an agent that modulates the function of a CX2 gene, the method comprising:

(a) providing a cell comprising a disruption in a CX2 gene;

(b) contacting the cell with an agent; and

(c) determining whether the function of the CX2 gene is modulated.

15. The method of claim 13 or claim 14, wherein the cell is derived from the non-human transgenic animal of claim 8.

16. An agent identified by the method of claim 11, claim 12, claim 13, or claim 14.

17. A transgenic mouse comprising a disruption in a CX2 gene, wherein the transgenic mouse exhibits at least one of the following phenotypes: increased body weight, increased body length, or increased body weight to body length ratio as compared to wild-type mice.

18. A transgenic mouse comprising a disruption in a CX2 gene, wherein the transgenic mouse exhibits at least one of the following phenotypes: increased tolerance to glucose or increased ability to metabolize glucose as compared to wild-type mice.

19. A transgenic mouse comprising a disruption in a CX2 gene, wherein the transgenic mouse exhibits a decrease in response threshold to metrazol.

20. A method of producing a transgenic mouse comprising a disruption in a CX2 gene, wherein the transgenic mouse exhibits at least one of the following phenotypes according to claim 17, claim 18, or claim 19, the method comprising:

(a) introducing a CX2 gene targeting construct into a cell;

(b) introducing the cell into a blastocyst;

(c) implanting the resulting blastocyst into a pseudopregnant mouse, wherein said pseudopregnant mouse gives birth to a chimeric mouse; and

(d) breeding the chimeric mouse to produce the transgenic mouse comprising a disruption in a CX2 gene.

31. A cell derived from the transgenic mouse of claim 17, claim 18, claim 19, or claim 20.

32. A method of identifying an agent that ameliorates a phenotype associated with a disruption in a CX2 gene, the method comprising:

(a) administering an agent to a transgenic mouse comprising a disruption in a CX2 gene; and

(b) determining whether the agent ameliorates at least one of the following phenotypes: : increased body weight, increased body length, or increased body weight to body length ratio as compared to wild-type mice.

33. A method of identifying an agent which modulates CX2 expression, the method comprising:

(a) administering an agent to the transgenic mouse comprising a disruption in a CX2 gene; and

(b) determining whether the agent modulates CX2 expression in the transgenic mouse, wherein the agent has an effect on at least one of the following: : increased body weight, increased body length, or increased body weight to body length ratio as compared to wild-type mice.

34. A method of identifying an agent which modulates CX2 gene function, the method comprising:

(a) providing a cell comprising a disruption in a CX2 gene;

(b) contacting the cell with an agent; and

(c) determining whether the agent modulates CX2 gene function, wherein the agent modulates a phenotype associated with a disruption in a CX2 gene.

35. The method of claim 25, wherein the phenotype comprises at least one of the following: increased body weight, increased body length, or increased body weight to body length ratio as compared to wild-type mice.

37. An agent identified by the method of claim 32, claim 33, claim 34, or claim 35.

38. An agent that modulates the function, expression or activity of a CX2 gene.

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28. A method of ameliorating a condition associated with impaired glucose tolerance, the method comprising administering to a subject in need, a therapeutically effective amount of an agent that modulates CX2 function, expression or activity.

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